



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,306	10/10/2000	Marc Cartier	TER00-03	4347

7590

11/13/2002

David E Huang Esq
Chapin & Huang LLC
Westborough Office Park
1700 West Park Drive
Westborough, MA 01581

EXAMINER

ALCALA, JOSE H

ART UNIT PAPER NUMBER

2827

DATE MAILED: 11/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/685,306

Applicant(s)

CARTIER ET AL.

Examiner

Jose H Alcala

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 22-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 22-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 20 June 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This non-final rejection is in response to amendment filed on 6/20/02.

Drawings

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 6/20/02 have been disapproved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.
3. The drawings are objected to because: Figure 3 is improperly crosshatched. The parts or sections of the drawings which are shown in cross section, must be crosshatched with different patterns to differentiate between the layers, using the suggested patterns stated in the MPEP section below. For example, the sections which are made of a dielectric material are suggested to be shown with a different crosshatching pattern than the sections which are made of a conductive material. All of the parts shown in the section, and only those parts, must be crosshatched. The crosshatching patterns should be selected from those shown on page 600-81 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-18, 22-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 1, it is reciting the limitation: "the section of circuit board material" in lines 7-8, and 12. There is insufficient antecedent basis for this limitation in the claim.

Regarding Claim 3, it is not clear how can the first ground pad and the second ground pad be: "physically contacting" each of the first and second sets of ground vias, and be disposed in a coplanar position at the same time. It is further unclear if each ground pad is contacting all the vias of each set of ground vias, in which case there may be 112 1st paragraph problems with the claim.

Regarding Claim 7, it is not clear if the pin is part of the signal conductor, or if it is part of a device attached to the circuit board. In addition, the claim is omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how is the pin attached to the elements of the circuit board, such as the signal via.

Regarding Claim 12, it is not clear if the "connector" is part of the circuit board or if it is a separate element or device attached to the circuit board. In addition, the claim is

omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how is the connector connecting and attached to the signal launch and how it is related to the ground and signal vias.

Regarding Claim 13, it is reciting the limitation: "the section of circuit board material" in lines 7-8, and 11-12. There is insufficient antecedent basis for this limitation in the claim. Furthermore, it is not clear if the "coaxial connector" is part of the circuit board or if it is a separate element or device attached to the circuit board. In addition, the claim is omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how is the coaxial connector connecting and attached to the signal launch and how it is related to the ground and signal vias.

Regarding Claim 18, the claim is omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how is the pin located in relation to the coaxial connector, does it has a portion inside the connector or is the pin completely inside the circuit board.

Regarding Claim 27, it is not clear if the "coaxial connector" is part of the circuit board or if it is a separate element or device attached to the circuit board. In addition, the claim is omitting essential structural cooperative relationships of elements, such

Art Unit: 2827

omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how is the coaxial connector connecting and attached to the signal launch and how it is related to the ground and signal vias.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

7. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1,5-7,9,11-13,16-18,22-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Andry et al. (US Patent No. 6,392,160). As best understood by the examiner:

Regarding Claim 1, Andry teaches a circuit board, comprising a circuit board portion having a signal layer (reference number 20T-4), a ground layer (reference

Art Unit: 2827

number 44G-N), and dielectric material (reference number 48) that physically separates the signal layer and the ground layer; and a signal launch having: a signal via (reference number 37) that physically contacts a signal conductor of the signal layer and the dielectric material of the section of circuit board material, and a first set of ground vias (reference number 39) and a second set of ground vias (reference number 91) that physically contact a ground conductor of the ground layer and the dielectric material of the section of circuit board material, wherein each of the first set of ground vias is disposed a first radial distance from the signal via, wherein each of the second set of ground vias is disposed a second radial distance from the signal via, and wherein the first and second radial distances are different (See Figure 2B).

Regarding Claim 5, Andry teaches that wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias (See figure 2B), and wherein the signal via (reference number 37) has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias (reference number 91).

Regarding Claim 6, Andry teaches that the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein each of the first set of ground vias (reference number 39) has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias (reference number 91).

Regarding Claim 7, Andry teaches that the signal launch further includes: a signal pin (Reference number 22-1) that electrically connects with the signal conductor of the circuit board portion through the signal via, the signal pin extending perpendicularly from a plane of the circuit board portion.

Regarding Claim 9, Andry teaches that at least a portion (section of reference number 22-1 which stays outside of the circuit board and inside the coaxial conductor) of the signal pin diameter that is greater than an inner diameter of the signal via, and wherein the signal pin connects to the signal via in a press-fit manner (See Figure 2B).

Regarding Claim 11, Andry teaches that each of the first set of ground vias is disposed between the signal via and a respective one of the second set of ground vias (See Figure 2B).

Regarding Claim 12, Andry teaches a connecting surface (top surface of circuit board) that faces a connector (reference number 22) when the connector connects to the signal launch and a distal surface (bottom surface of the circuit board) that faces away from the connector when the connector connects to the signal launch, and wherein the signal conductor of the circuit board portion connects with the signal via of the signal launch at a point along the signal via that is closer to the distal surface than the connecting surface (See Figure 2B).

Regarding Claim 13, Andry teaches a connection system (device of figure 2B), comprising a circuit board that includes a circuit board portion having a signal layer (reference number 20T-4), a ground layer (reference number 44G-N), and dielectric material (reference number 48) that physically separates, the signal layer and the

Art Unit: 2827

ground layer, and a signal launch having: a signal via (reference number 37) that physically contacts a signal conductor of the signal layer and the dielectric material of the circuit board portion, and a first set of ground vias (reference number 39) and a second set of ground vias (reference number 91) that physically contact a ground conductor of the ground layer and the dielectric material of the circuit board portion, wherein each of the first set of ground vias is disposed a first radial distance from the signal via, wherein each of the second set of ground vias is disposed a second radial distance from the signal via, and wherein the first and second radial distances are different (See Figure 2B); and a coaxial connector (reference number 22) that mounts to the signal launch of the circuit board in order to provide electrical access to the signal and ground conductors of the circuit board portion.

Regarding Claim 16, Andry teaches that wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias (See figure 2B), and wherein the signal via (reference number 37) has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias (reference number 91).

Regarding Claim 17, Andry teaches that the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein each of the first set of ground vias (reference number 39) has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias (reference number 91).

Regarding Claim 18, Andry teaches that the signal launch further includes: a signal pin (Reference number 22-1) that electrically connects with the signal conductor of the circuit board portion through the signal via, the signal pin extending perpendicularly from a plane of the circuit board portion.

Regarding Claim 22, Andry teaches that the first set of ground vias includes multiple first ground vias which are substantially evenly distributed in a radial manner around the signal via, and wherein the second set of ground vias includes multiple second ground vias which are substantially evenly distributed in a radial manner around the signal via. See figure 2B.

Regarding Claim 23, Andry teaches that the signal via, at least two of the first ground vias and at least two of the second ground vias are disposed co-linearly (See figure 2B).

Regarding Claim 24, Andry teaches that the first set of ground vias includes multiple first ground vias which are substantially evenly distributed in a radial manner around the signal via, and wherein the second set of ground vias includes multiple second ground vias which are substantially evenly distributed in a radial manner around the signal via. See figure 2B.

Regarding Claim 25, Andry teaches that the signal via, at least two of the first ground vias and at least two of the second ground vias are disposed co-linearly (See figure 2B).

Regarding Claim 26, Andry teaches a circuit board, comprising: a section of circuit board material having a signal conductor (reference number 20T-4), a ground

Art Unit: 2827

conductor (reference number 44G-N), and dielectric material (reference number 48) that physically separates the signal conductor and the ground conductor; and a signal launch having: a signal via (reference number 37) that physically contacts the signal conductor and the dielectric material of the section of circuit board material, and a first set of ground vias (reference number 39) and a second set of ground vias (reference number 91) that physically contact the ground conductor and the dielectric material of the section of circuit board material, wherein each of the first set of ground vias is disposed a first radial distance from the signal via, wherein each of the second set of ground vias is disposed a second radial distance from the signal via, and wherein the first and second radial distances are different (See Figure 2B).

Regarding Claim 27, Andry teaches a connection system (device of figure 2B), comprising: a circuit board that includes (i) a section of circuit board material having a signal conductor (reference number 20T-4), a ground conductor (reference number 44G-N), and dielectric material (reference number 48) that physically separates the signal conductor and the ground conductor, and (ii) a signal launch having: a signal via (reference number 37) that physically contacts the signal conductor and the dielectric material of the section of circuit board material, and a first set of ground vias (reference number 39) and a second set of ground vias (reference number 91) that physically contact the ground conductor and the dielectric material of the section of circuit board material, wherein each of the first set of ground vias is disposed a first radial distance from the signal via, wherein each of the second set of ground vias is disposed a second radial distance from the signal via, and wherein the first and second radial distances are

different (See Figure 2B); and a coaxial connector (reference number 22) that mounts to the signal launch of the circuit board in order to provide electrical access to the signal and ground conductors of the circuit board.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 4,10,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andry et al. (US Patent No. 6,392,160). As best understood by the examiner:

Regarding Claims 4 and 15, Andry teaches all the elements of the instant claimed invention as stated supra for claims 1 and 13, and further teaches that the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, but fails to explicitly teach that the signal via has an inner diameter that is smaller than an inner diameter of each of the first set of ground vias. It would have been an obvious matter of design choice to make the signal via having an inner diameter that is smaller than an inner diameter of each of the first set of ground vias, since applicant has not disclosed that making the signal via having an inner diameter that is smaller than an inner diameter of each of the first set of ground vias solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with

Art Unit: 2827

the signal via having an inner diameter that equal or bigger than an inner diameter of each of the first set of ground vias.

Regarding Claim 10, Andry teaches all the elements of the instant claimed invention as stated supra for claim 1, but fails to explicitly teach that the dielectric material of the circuit board portion separates the first set of ground vias from the signal via by less than 0.082 of an inch. It was well known in the art at the time the invention was made to fit as much elements in a circuit board as functionally efficient, by reducing the spacing between them, in order to improve integration. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Andry in order to have a separation between the first set of ground vias and the signal via of less than 0.082 of an inch, thus improving integration. In addition, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

11. Claims 2,3,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andry et al. (US Patent No. 6,392,160) in view of Kan (US Patent No. 6,407,652). As best understood by the examiner:

Regarding Claims 2 and 14, Andry teaches all the elements of the instant claimed invention as stated supra for claims 1 and 13, but fails to explicitly teach a ground pad, disposed on a surface of the circuit board portion, the ground pad

physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the circuit board portion.

Kan teaches a ground pad (reference number 2), disposed on a surface of a circuit board portion, the ground pad physically contacting each of the first and second sets of ground vias (Reference numbers 3 and 4) of the signal launch and the dielectric material of the circuit board portion. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Andry and Kan in order to have a ground pad disposed on a surface of a circuit board portion, the ground pad physically contacting each of the first and second sets of ground vias, thus improving the connection and minimizing the noise.

Regarding Claim 3, Andry fails to explicitly teach a first ground pad, disposed on a first surface of the circuit board portion, the first ground pad physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the circuit board portion; and a second ground pad, disposed on a second surface of the circuit board portion that is coplanar with the first surface of the circuit board portion, the second ground pad physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the circuit board portion.

Kan teaches a first ground pad (reference number 2), disposed on a first surface (top surface) of the circuit board portion, the first ground pad physically contacting each of the first and second sets of ground vias (Reference numbers 3 and 4) of the signal launch and the dielectric material of the circuit board portion; and a second ground pad

(reference number 11), disposed on a second surface (bottom surface) of the circuit board portion, the second ground pad physically contacting each of the first and second sets of ground vias (Reference numbers 3 and 4) of the signal launch and the dielectric material of the circuit board portion. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Andry and Kan in order to have a ground pad disposed on a surface of a circuit board portion, the ground pad physically contacting each of the first and second sets of ground vias, thus improving the connection and minimizing the noise.

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andry et al. (US Patent No. 6,392,160) in view of Kuroda et al. (US Patent No. 5,624,278). As best understood by the examiner:

Reference Claim 8, Andry teaches that the signal pin has a diameter that is less than an inner diameter of the signal via (See figure 2B), but fails to teach that the signal pin connects to the signal via through a solder joint. Kuroda teaches that the signal pin (reference number 72b) connects to the circuit board through a solder joint (Reference number 78 in figure 11D). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Andry and Kuroda in order to have the signal pin connects to the circuit board through a solder joint, thus improving the strength of the connection and the adhesion between the pin and the circuit board.

Response to Arguments

13. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection

Conclusion


14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references have some teachings similar to aspects of the instant claimed invention: Stursa (US Patent No 4,645,288), Lambert (US Patent No 5,795,162), Dearden et al. (US Patent No 6,417,747), Snyder et al. (US Patent No 5,046,966), Magnuson (US Patent No 5,823,790) and Menze (US Patent No 5,683,255).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose H Alcala whose telephone number is (703) 305-9844. The examiner can normally be reached on Monday to Friday.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

17. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JHA
November 7, 2002


ALBERT W. PALADINI
PRIMARY EXAMINER